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Contents

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Surveillance Trends

Cold Weather Injuries, Active Duty Soldiers, 1997-2000

Cold weather injuries (CWI) are a serious threat to the health and performance of soldiers. Prolonged exposures to low temperatures, wind, and moisture during military operations and training can place soldiers at extremely high risk. During 1995-1996, there were 293 reported CWIs[1] among active duty soldiers. The majority of these cases occurred among soldiers who were male, black, and in the youngest age group (< 20 years). This report summarizes the CWI experience of active duty soldiers during the cold weather seasons of 1997-2000.

Methods. All data were derived from the Defense Medical Surveillance System. Inpatient, outpatient, and reportable events data records were searched to identify all CWIs (ICD-9-CM codes: 991.0–991.9). The following periods were considered cold weather seasons: October 1997–March 1998, October 1998–March 1999, and October 1999–March 2000. The study population included all soldiers on active duty during these cold weather seasons. Incidence rates were calculated by dividing the number of CWI cases by the person-years of active Army service during each cold weather season. Incidence rates were examined in relation to gender, age, and race.

Results. There were 1,177 incident CWIs during the cold weather seasons included in the analysis. The overall incidence rate was 165.0 per 100,000 person-years. During the 1997-1998 season, 274 soldiers were diagnosed with CWIs, and the crude incidence rate was 113.8 per 100,000 person-years. During the 1998-1999 season, there were 372 CWI cases and a crude incidence rate of 156.0 per 100,000 person-years. During the 1999-2000 season, there were 531 CWI cases and a crude incidence rate of 226.7 per 100,000 person-years. Thus, compared to the 1997-1998 season, CWI rates were more than one-third higher in 1998-1999 and approximately twice as high in 1999-2000 (table 1).

During the first two seasons, "frostbite" (ICD-9-CM codes: 991.0-991.3) was the most common CWI-related diagnosis (figure 1). During the 1999-2000 season, however, "other specified and unspecified effects of reduced temperature" (ICD-9-CM: 991.8-991.9) were the most common diagnoses (figure 1).

In general, CWI rates were approximately twice as high among women than men (figure 2). In addition, CWI rates among black soldiers were approximately 2.5 times higher than among white sol-

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Figures continued on page 7

The Medical Surveillance Monthly Report is prepared by the Army Medical Surveillance Activity , Directorate of Epidemiology and Disease Surveillance, United States Army Center for Health Promotion and Preventive Medicine (USACHPPM).

Inquiries regarding content or material to be considered for publication should be directed to the editor, Army Medical Surveillance Activity, Bldg. T-20, Rm 213, 6825 16th St., NW, Washington DC, 20307-5000. E-mail: editor@amsa.army.mil

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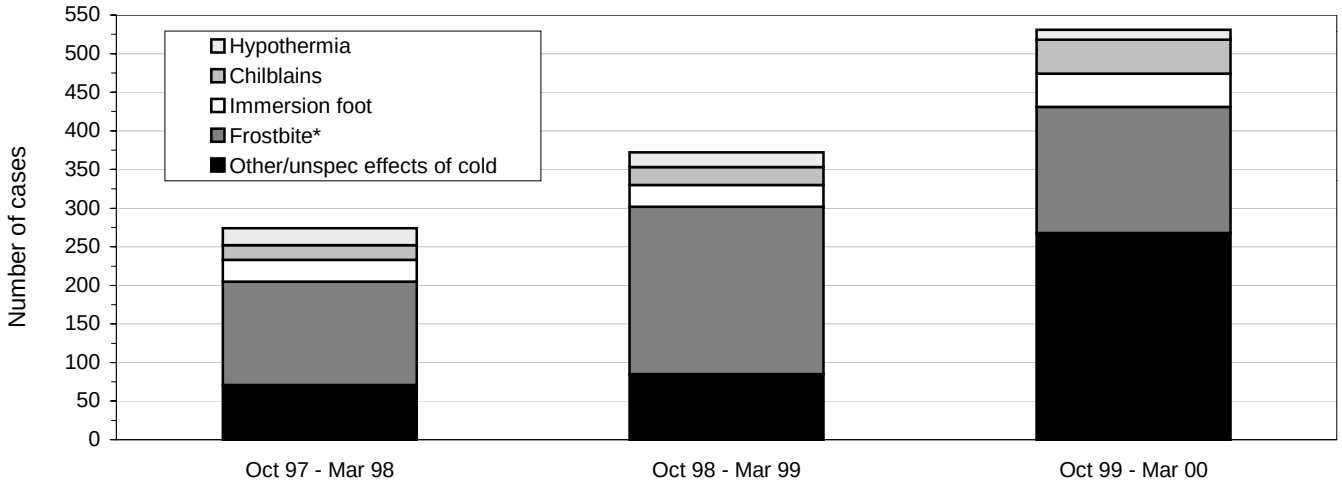
Table 1. Incidence rates of cold weather injuries, October-March, 1997-2000, US Army

ICD-9	Primary Diagnosis	Oct 1997 - Mar 1998		Oct 1998 - Mar 1999		Oct 1999 - Mar 2000	
		Cases[1]	Rate[2]	Cases[1]	Rate[2]	Cases[1]	Rate[2]
991.0	Frostbite of face	3	1.2	7	2.9	5	2.1
991.1	Frostbite of hand	11	4.6	21	8.8	23	9.8
991.2	Frostbite of foot	23	9.6	37	15.5	47	20.1
991.3	Frostbite of other and unspecified sites	97	40.3	152	63.7	88	37.6
991.4	Immersion foot	28	11.6	28	11.7	43	18.4
991.5	Chilblains	19	7.9	23	9.6	44	18.8
991.6	Hypothermia	22	9.1	19	8	13	5.6
991.8	Other specified effects of reduced temperature	8	3.3	10	4.2	18	7.7
991.9	Unspecified effect of reduced temperature	63	26.2	75	31.4	250	106.7
	Total	274	113.8	372	156	531	226.7

1. Incidence based on hospitalizations, outpatient visits, and reportable events.
2. Rates expressed as cases per 100,000 person-years.

Figure 1. Cold weather injuries, by diagnosis, October-March, 1997-2000, US Army



* Includes frostbite of face, hand, foot, and other/unspecified sites.

Figure 2. Cold weather injury rates, by gender, October-March, 1997-2000, US Army

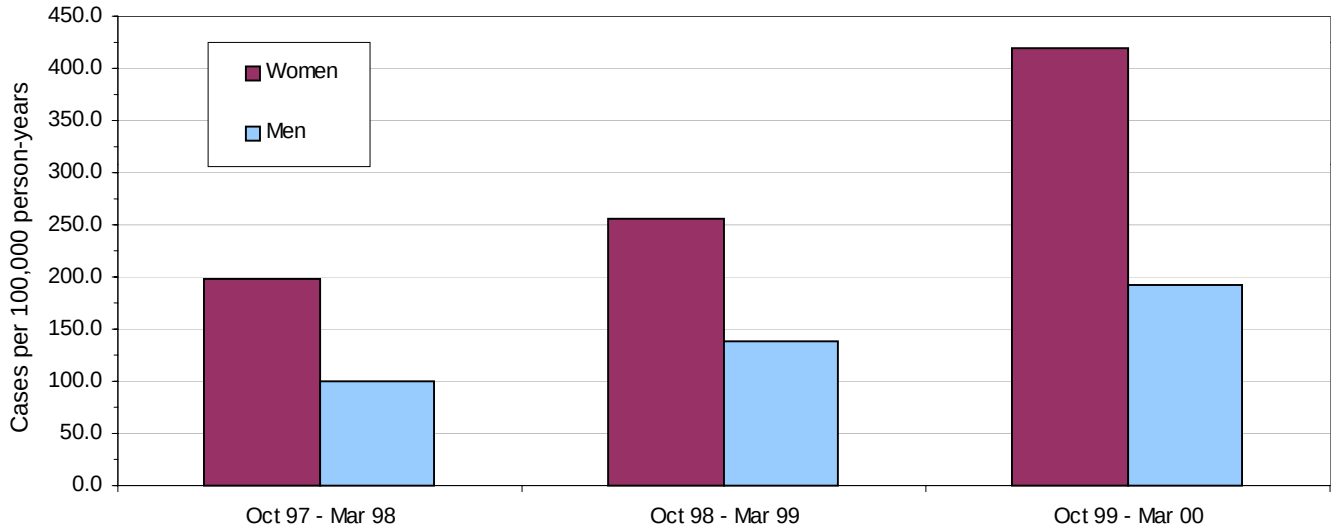


Table I. Sentinel reportable events, US Army medical treatment facilities[1] Cumulative events for all beneficiaries, calendar year through November 30, 1999 and 2000[2]

Reporting Facility	Number of reported events[3]		Environmental				Food- and Water-borne							
			Cold		Heat		Campylobacter		Giardia		Salmonella		Shigella	
	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000
NORTH ATLANTIC RMC														
Walter Reed AMC, DC	165	177	-	-	-	-	4	4	5	6	3	9	-	5
Aberdeen Prov. Grd., MD	24	39	-	-	-	-	-	-	-	-	-	-	-	-
FT Belvoir, VA	201	211	-	-	2	8	9	13	10	5	11	9	3	2
FT Bragg, NC	1156	1393	9	4	109	164	8	2	2	-	33	17	-	1
FT Drum, NY	197	150	15	9	3	1	1	-	4	-	1	-	-	-
FT Eustis, VA	202	228	1	-	3	8	2	4	-	-	4	5	1	-
FT Knox, KY	285	235	2	-	15	10	3	1	2	2	1	1	3	-
FT Lee, VA	169	249	-	-	1	1	-	-	-	-	2	-	-	-
FT Meade, MD	66	91	-	-	-	-	-	-	1	-	-	2	-	-
West Point, NY	59	100	-	1	2	1	-	-	-	-	-	3	1	-
GREAT PLAINS RMC														
Brooke AMC, TX	381	275	-	-	9	4	-	3	-	5	7	4	4	6
Beaumont AMC, TX	277	292	-	-	5	6	-	-	-	2	4	8	2	6
FT Carson, CO	697	585	2	-	-	-	5	1	10	5	6	2	1	9
FT Hood, TX	1345	1767	-	1	8	32	2	4	1	1	10	11	8	4
FT Huachuca, AZ	56	55	-	-	2	1	1	-	-	-	1	-	1	-
FT Leavenworth, KS	20	31	-	-	-	2	2	1	1	2	-	1	-	-
FT Leonard Wood, MO	162	164	4	5	3	11	-	1	1	1	2	-	-	-
FT Polk, LA	195	249	-	-	1	4	-	-	-	-	-	-	-	-
FT Riley, KS	219	220	1	23	11	4	-	-	-	-	-	-	-	-
FT Sill, OK	264	288	-	-	9	8	-	-	-	-	-	-	2	-
SOUTHEAST RMC														
Eisenhower AMC, GA	189	281	1	-	4	1	-	-	-	-	2	2	-	1
FT Benning, GA	379	352	-	-	100	52	1	3	2	3	14	16	2	1
FT Campbell, KY	305	456	2	2	10	4	7	3	3	6	2	16	11	13
FT Jackson, SC	402	416	-	-	-	1	-	-	-	-	1	-	-	-
FT Rucker, AL	52	77	-	-	4	1	-	-	-	-	-	3	1	-
FT Stewart, GA	462	513	-	-	20	27	-	-	3	-	5	8	-	-
WESTERN RMC														
Madigan AMC, WA	437	682	-	-	-	-	-	5	1	6	-	6	1	2
FT Irwin, CA	38	56	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	116	89	43	8	-	-	-	-	-	-	-	-	-	-
OTHER LOCATIONS														
Tripler, HI	467	757	-	-	1	3	22	40	12	8	11	11	1	2
Europe	648	1540	4	5	-	-	28	16	-	3	14	30	3	2
Korea	428	483	8	2	5	5	1	-	-	-	-	8	-	-
Total	**10,063**	**12,501**	**92**	**60**	**327**	**359**	**96**	**101**	**58**	**55**	**134**	**172**	**45**	**54**

1. Main and satellite clinics.
2. Events reported by December 7, 1999 and 2000.
3. Tri-Service Reportable Events, Version 1.0, July 1999.

Table I. (Cont'd) Sentinel reportable events, US Army medical treatment facilities[1] Cumulative events for all beneficiaries, calendar year through November 30, 1999 and 2000[2]

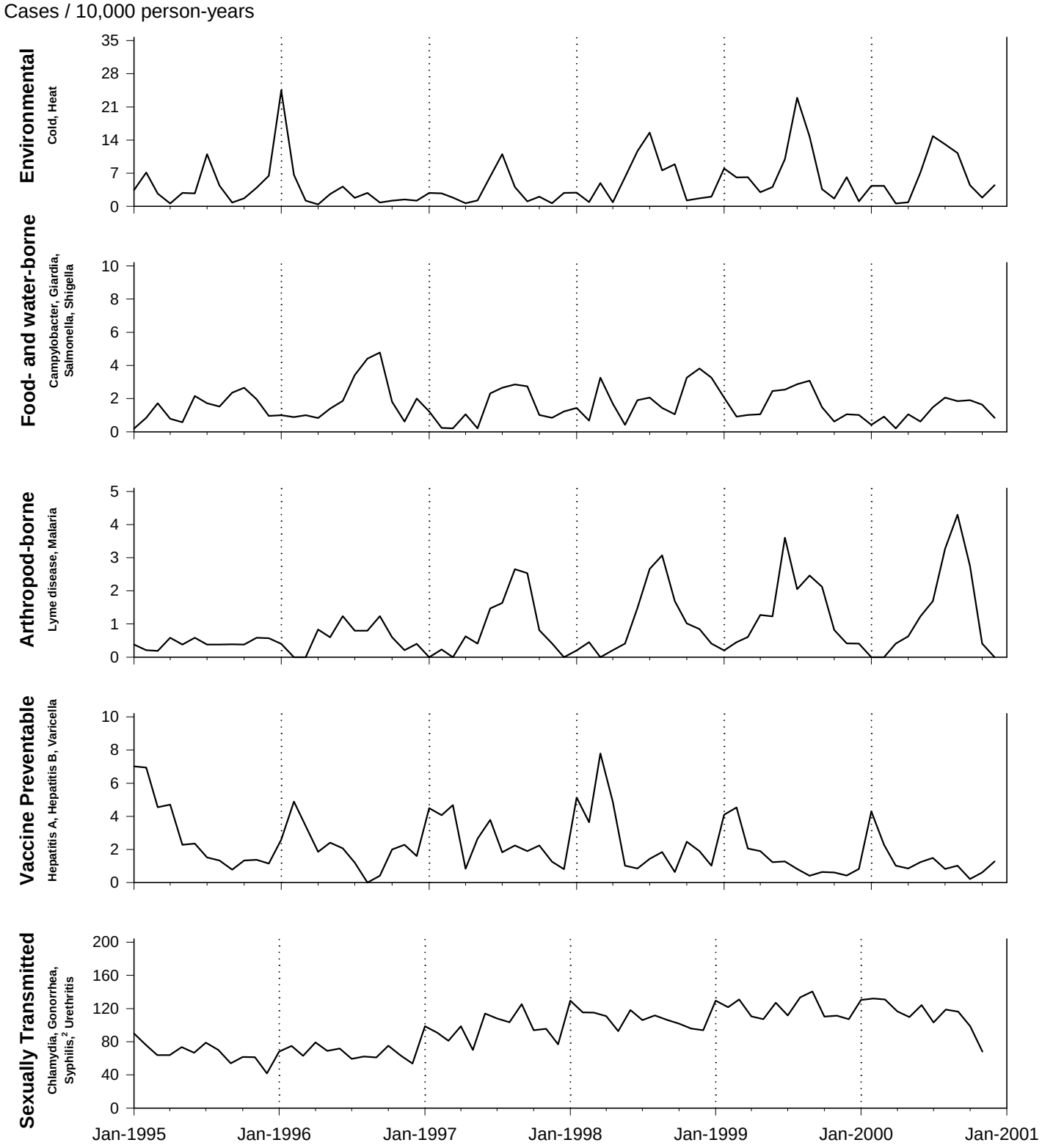
Arthropod-borne				Vaccine Preventable						Sexually Transmitted							
Lyme Disease		Malaria		Hepatitis A		Hepatitis B		Varicella		Chlamydia		Gonorrhea		Syphilis[4]		Urethritis	
Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000
1	3	4	-	1	1	-	1	3	3	81	62	19	25	3	2	1	-
-	3	-	-	-	-	-	3	1	1	8	18	13	5	-	2	2	2
-	-	-	-	1	-	-	3	-	1	128	125	34	29	-	3	-	-
4	2	3	6	-	-	-	-	1	6	511	557	236	268	2	3	233	357
-	-	3	1	-	-	-	-	6	5	107	96	51	35	-	-	3	2
-	1	1	-	-	-	1	1	2	2	135	164	49	39	-	-	-	-
-	-	-	-	-	-	-	1	1	7	199	169	56	41	1	1	-	-
-	-	-	-	-	1	1	-	-	-	134	190	28	57	3	-	-	-
3	-	-	-	-	-	-	-	1	-	52	67	6	11	-	1	-	2
16	35	-	1	-	-	2	1	1	2	32	41	3	12	-	1	-	-
2	-	2	2	3	-	4	-	2	2	171	151	54	55	-	2	1	-
-	-	1	-	1	3	-	-	2	1	221	216	20	36	-	-	13	6
-	-	-	1	-	-	1	1	2	-	503	447	90	61	-	-	69	40
1	-	4	1	1	1	1	2	3	2	788	940	221	347	4	1	264	397
-	-	-	-	1	-	-	-	-	-	43	43	5	11	-	-	-	-
-	1	-	-	-	-	-	-	-	-	14	20	3	2	-	-	-	-
-	1	1	-	-	-	1	-	12	13	92	86	28	31	1	-	8	10
-	-	1	-	-	-	-	-	-	-	154	214	35	30	2	-	-	-
-	-	-	-	-	-	-	-	-	-	152	127	55	62	-	1	-	-
-	2	1	-	-	-	6	-	6	4	146	164	59	59	2	-	30	45
-	2	-	3	1	-	3	3	2	2	151	206	13	24	1	-	-	-
-	-	1	8	1	-	-	1	2	8	137	154	86	99	1	3	-	-
-	1	5	9	-	-	-	1	-	2	168	254	96	136	-	1	-	-
-	-	-	-	-	-	-	-	6	3	330	358	51	45	6	4	-	-
-	-	-	1	-	-	-	-	-	-	34	51	13	15	-	-	-	-
-	-	4	1	-	-	1	-	4	-	148	169	91	111	-	-	184	193
-	3	6	7	-	1	-	2	-	-	258	458	51	61	-	-	110	108
-	-	-	1	-	-	5	-	-	5	29	39	4	8	-	2	-	-
-	-	1	-	-	-	1	-	2	-	58	77	9	3	-	-	-	-
-	-	4	3	-	1	1	2	-	1	291	525	72	95	-	-	-	1
9	17	2	-	2	1	6	7	4	9	447	1186	112	244	2	2	1	-
-	-	21	14	-	-	14	1	3	3	325	369	12	43	15	13	-	11
36	**71**	**65**	**59**	**12**	**9**	**48**	**30**	**66**	**82**	**6,047**	**7,743**	**1,675**	**2,100**	**43**	**42**	**919**	**1,174**

4. Primary and secondary.

Note: Completeness and timeliness of reporting varies by facility

Source: Army Reportable Medical Events System.

Figure I. Sentinel reportable events (grouped), active duty soldiers, January 1995 - November 2000[1]



1. Events reported by December 7, 2000.
2. Primary and Secondary.

Source: Army Reportable Medical Events System.

Continued from page 3

Figure 3. Cold weather injury rates, by race, October-March, 1997-2000, US Army

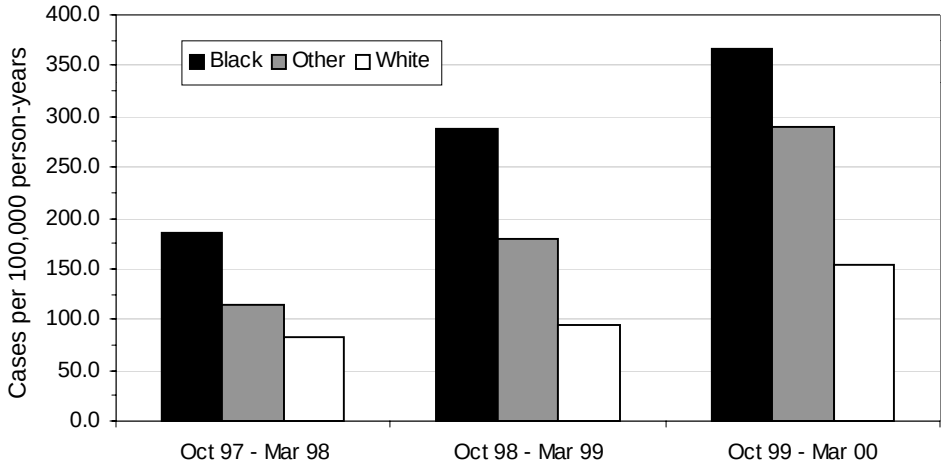


Figure 4. Cold weather injury rates, by age, October-March, 1997-2000, US Army

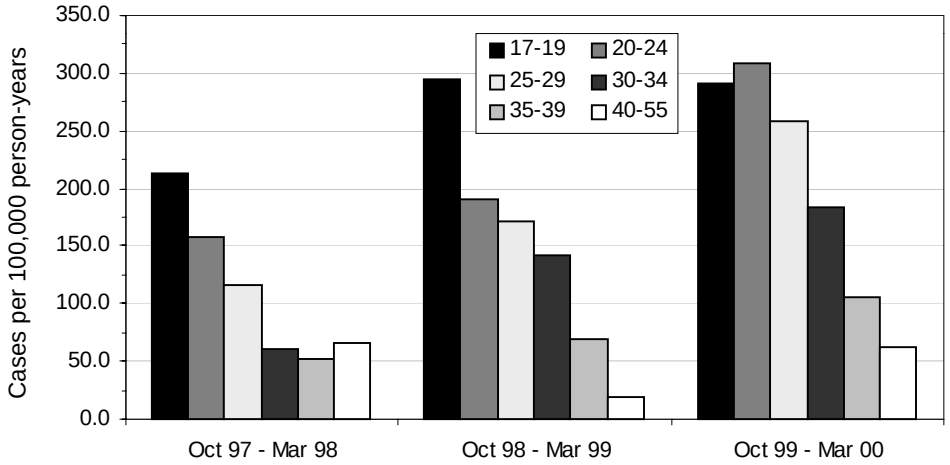
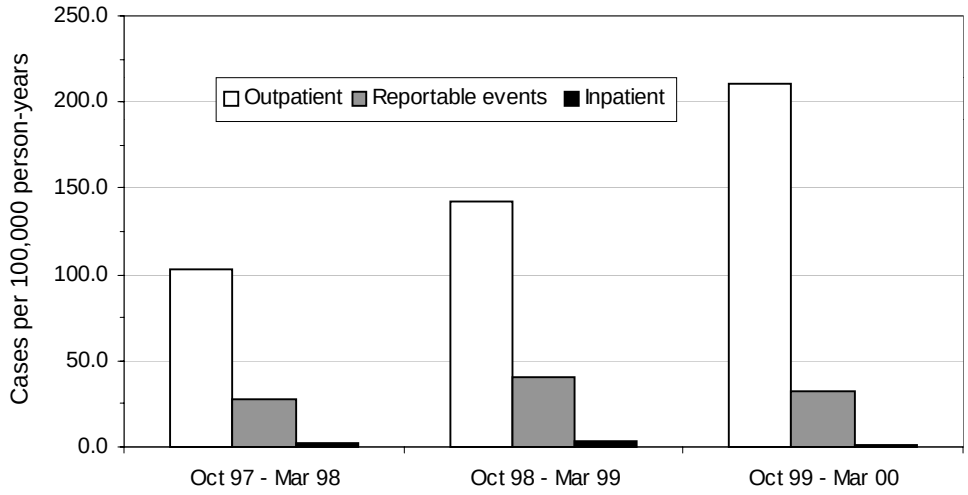


Figure 5. Cold weather injuries, by sources of information, October-March, 1997-2000, US Army



diers and 1.5 times higher than among "others" (figure 3, page 7). In all race and gender subgroups, CWI rates increased from each year to the next (figures 2,3).

In general, CWI rates declined with age: the CWI rate among the youngest (17-20 years) soldiers was approximately 5.5 times higher than among the oldest (>39 years) (figure 4, page 7). During the 1997-1998 and 1998-1999 cold weather seasons, the youngest soldiers had the highest CWI rates; however, during 1999-2000, 20-24 year olds had a slightly higher rate than their younger counterparts (figure 4).

Rates of CWIs diagnosed in outpatient settings significantly increased from year to year (figure 5, page 7). In contrast, there were no clear trends in rates of CWIs that required hospitalization or that were reported as "notifiable medical events" (figure 5).

Editorial comment. Cold weather injuries have long been a significant military medical concern. In addition to their potentially severe impacts on military operational effectiveness, CWIs can cause significant short- and long-term disabilities and can be life-threatening. For example, a six-month followup of 40 patients with frostbite found that 65% still had symptoms attributable to their initial injuries.[2]

This analysis documents that rates of CWI diagnoses among US Army soldiers steadily increased over the past three cold weather seasons. This finding should be interpreted with caution. For example, since most CWIs were ascertained from ambulatory clinic data, the increasing trend overall may be entirely attributable to higher rates of diagnosis and more complete reporting of relatively minor injuries (e.g., "effects of reduced temperature") in outpatient settings. If so, rather than documenting a worsening problem with CWIs, these results may reflect greater sensitivity to and more aggressive management of the early stages of CWIs by unit leaders and medical staffs. Still, increasing rates of CWIs in general should heighten awareness and concern regarding the threat of CWIs during cold weather. Predisposing factors for CWIs include low physical fitness, fatigue, dehydration, prior cold injury, poor circulation in peripheral body parts, alcohol consumption, and improper clothing.[4] In turn, all soldiers should be appropriately clothed and equipped for cold weather operations and training, informed of risk factors that may be modifiable, and trained in prevention practices.

In this analysis, black soldiers and those in the youngest age groups had significantly higher rates of CWIs than their counterparts. This finding is consistent with results from many other studies in military populations.[1,3] However, in this analysis, female soldiers had strikingly higher rates of CWIs than their male counterparts. We are unaware of other reports that document increased CWI risk among females compared to males—perhaps because women were not included or were underrepresented in most other studies of CWIs in military populations. If the finding is validated in other settings, the factors that contribute to increased CWI risk among female soldiers should be determined.

Analysis and report provided by Gabriella Andreotti, MPH, Analysis Group, Army Medical Surveillance Activity.

References

1. Army Medical Surveillance Activity. Cold weather injuries in active duty soldiers, 1995-6. *MSMR*, 1997;3(1):2-7.
2. Taylor MS, Kulungowski MA, Hamelink JK. Frostbite injuries during winter maneuvers: a long-term disability. *Mil Med*, 1989;154(8):411-2.
3. Taylor MS. Cold weather injuries during peacetime military training. *Mil Med*, 1992;157(11):602-4.
4. Rintamaki H. Predisposing factors and prevention of frostbite. *Int J Circumpolar Health*, 2000;59(2):114-21.

Case report

Ehrlichia chaffeensis Infection in an Active Duty Soldier Stationed in Korea

On November 14, 2000, a 20-year-old white female soldier stationed at Camp Nimble, (Tongduchon) Korea was admitted to the Internal Medicine Service of the 121st General Hospital (Yongsan) for evaluation of fever, rash, leukopenia, and thrombocytopenia. The patient presented to the Camp Casey Troop Medical Clinic (Tongduchon) 4 days prior to her hospital admission after a 48-hour history of headache, rigors, diffuse myalgias, and a pruritic rash over her left arm.

The patient was a water treatment specialist whose duties typically restricted her to the motor pool. She arrived in Korea in August 2000 after a leave in Tucson, Arizona en route from her prior duty station at Hunter Army Air Field, Fort Stewart, Georgia. She denied travel outside of Camp Nimble prior to the onset of her symptoms, with the exception of a field-training exercise in early September within Tongduchon (approximately 40 miles north of Seoul). She denied a history of known tick exposure. A presumptive diagnosis of non-specific viral infection was made. She was treated symptomatically with acetaminophen, diphenhydramine, and a guafenesin/phenylpropanolamine preparation.

The patient's symptoms persisted until 1 day prior to her hospitalization when a complete blood count revealed leukopenia (2.4 x 1000/mm^3, 86% neutrophils) and thrombocytopenia (127 M/mm^3). No additional therapy was initiated. However, on the following day, the patient had persistent symptoms, leukopenia (WBC 1.4 x 1000/mm^3, 74% neutrophils), thrombocytopenia (126 M/mm^3) and new onsets of nausea and emesis. She was referred for hospital admission.

Hospital course. On admission to the 121st General Hospital, the patient had a blood pressure of 123/77, pulse of 109, and oral temperature of 103.9° F (39.9° C). She appeared ill, though in no acute distress. Her physical examination was remarkable for bilaterally injected sclerae; scattered ulcerative oropharyngeal lesions overlying the buccal mucosa; the absence of nuchal rigidity, photophobia, adenopathy or organomegaly; and the presence of a diffuse, blanching maculopapular rash over her face, trunk, and both arms and legs. Purpuric lesions were noted over her left distal upper extremity and both proximal lower extremities; no lesions were noted over her palms or soles. Monospot and rapid streptococcal assays were negative. Admission and serial hematologic laboratory and serum aminotransferase values are shown on page 10.

The failure of further supportive therapy was apparent by the second hospital day. On that day, the patient had persistent fever, leukopenia and thrombocytopenia, increased serum aminotransferases, and progression of her dermatologic disease. Empiric treatment with doxycycline (100 mg po bid) was initiated. Within 24 hours of initiating doxycycline, her temperature was normal and her leukopenia was resolved, and within 72 hours, her blood counts were improving, and her underlying dermatologic disease was resolving. Her serum aminotransferase levels remained abnormal. She was discharged the following day.

Four days post-discharge, after completing a 7-day course of doxycycline, her serum aminotransferase levels remained abnormal. However, on followup 2 weeks after completing antibiotic therapy, her serum aminotransferases were normal. Of note, her serum alkaline phosphatase levels remained normal throughout the acute and convalescent phases of her infection.

Acute serum obtained on hospital admission demonstrated the presence of IgM antibody (>1:256) to *Ehrlichia chaffeensis* (ARUP Laboratories, Salt Lake City, UT). (Titers >1:16 are considered positive for the presence of IgM antibody to *E. chaffeensis*.) IgG antibody to *E. chaffeensis* was not detected. (Titers >1:256 are considered positive for the presence of IgG antibody to *E. chaffeensis*.) Convalescent serum drawn two weeks after the completion of antibiotic therapy again demonstrated the presence of IgM antibody (>1:16) to *E. chaffeensis*, though in diminished titers, while IgG antibody remained undetectable.

Editorial comment. Human ehrlichiosis is a tick-borne illness that is caused by obligate intracellular coccobacilli resembling rickettsia. Ehrlichiosis was

Figure 1. Hematocrit and white blood cell counts during acute and convalescent phases of ehrlichiosis, November 13-December 5, 2000

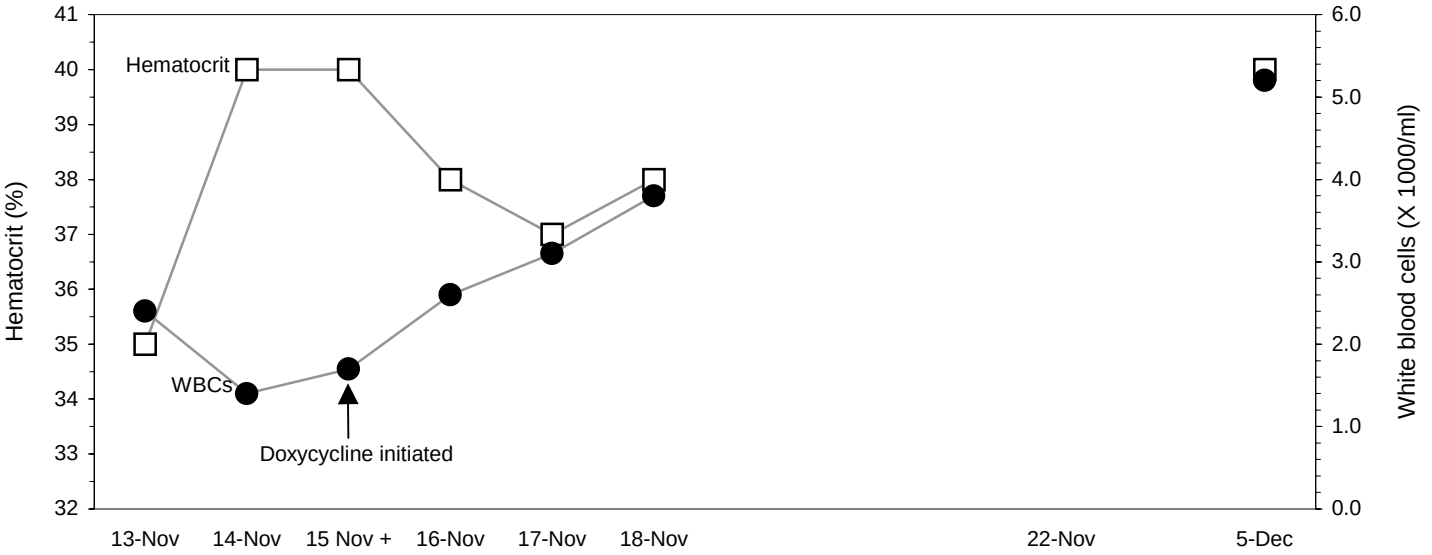


Figure 2. Platelet counts during acute and convalescent phases of ehrlichiosis, November 13-December 5, 2000

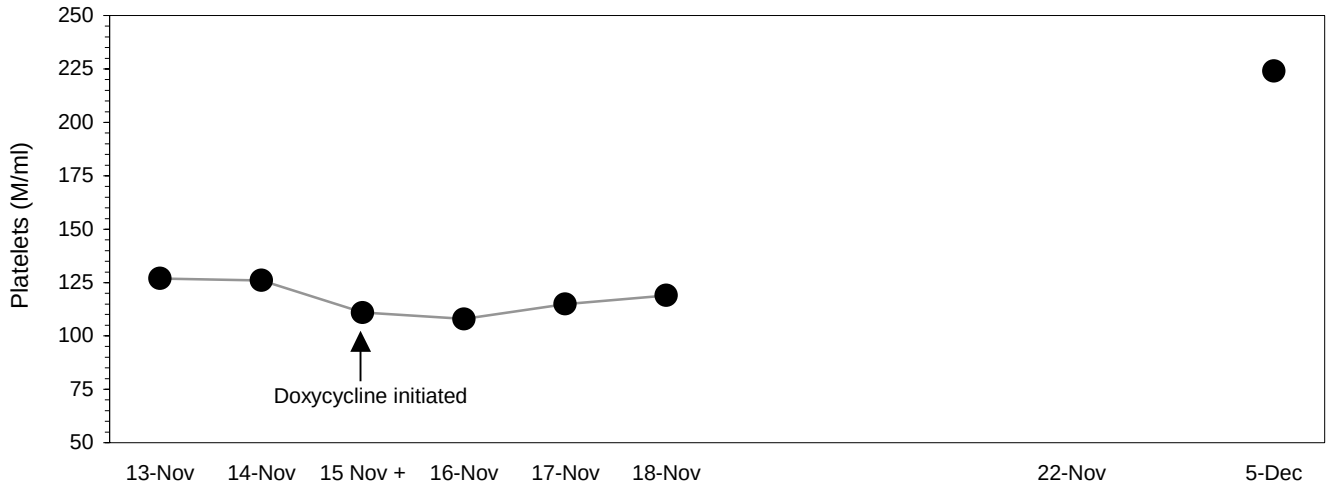
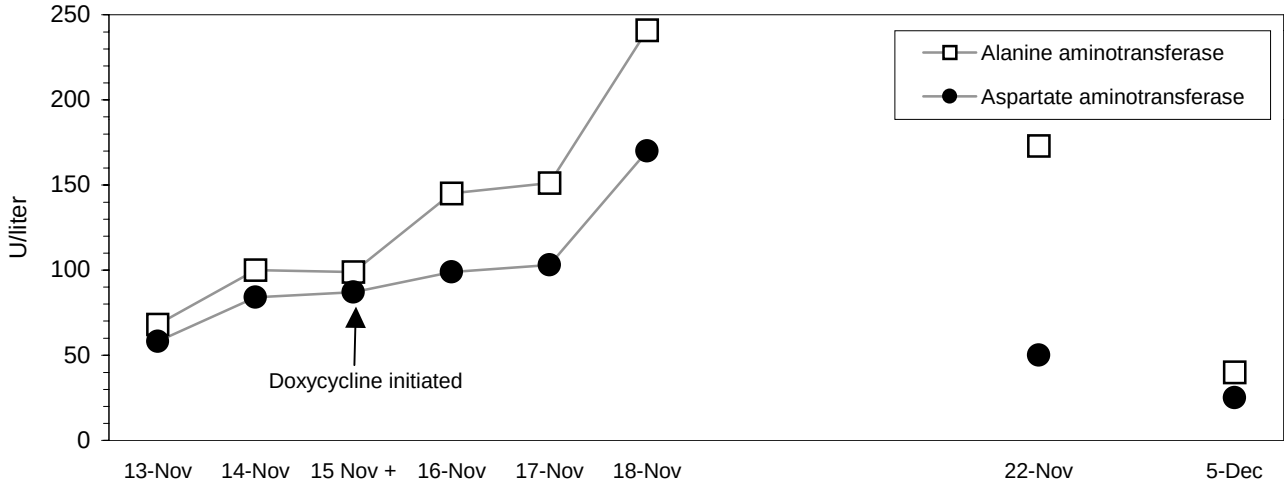


Figure 3. Liver enzyme concentrations during acute and convalescent phases of ehrlichiosis, November 13-December 5, 2000



first recognized in 1935 as a disease of dogs (canine ehrlichiosis) caused by *Ehrlichia canis*. The first human ehrlichial infection to be recognized was Sennetsu fever, a mononucleosis-like illness described in Japan in 1954. In 1986, the first report of ehrlichial infection in the United States occurred in a Detroit, Michigan man exposed to ticks in rural Arkansas,[1] and in 1990, the agent of human ehrlichiosis was subsequently isolated from the blood of a US Army reservist at Fort Chaffee, Arkansas.[2,3] This new species of ehrlichiae, *E. chaffeensis*, was found to resemble *E. canis* both serologically and morphologically and to predominantly infect mononuclear hematopoietic cells. In turn, its clinical expression was designated "human monocytic ehrlichiosis" (HME).

In 1994, a second type of human ehrlichiosis was recognized after causing 12 cases of ehrlichial illness in Minnesota and Wisconsin from 1990 to 1993.[4] This most recently recognized type of ehrlichiosis was designated "human granulocytic ehrlichiosis" (HGE) since the organism predominantly infects granulocytic hematopoietic cells. The *Ehrlichia* species that causes HGE has not yet been conclusively identified, so it is currently referred to as the "agent of HGE" (aoHGE).

Symptoms of both human and granulocytic ehrlichiosis begin 1-21 days following infection and resemble those of Rocky Mountain spotted fever (RMSF). Symptoms of ehrlichiosis vary greatly in severity, ranging from mild to life-threatening. There are no distinctive physical findings: the most common symptoms are high fever, headache, chills, and myalgias, but may also include nausea, vomiting, loss of appetite and malaise. Rash is rare, but when present may resemble the spotted rash of RMSF. During acute infection, leukopenia and thrombocytopenia occur, usually accompanied by a mild, transient hepatitis.

More than 400 cases of human *E. chaffeensis* infection have been reported to date, predominantly in the southeast and mid-Atlantic United States; however, several dozen cases of human granulocytic ehrlichiosis have been reported from midwestern and northeastern states. The geographic distribution of infections can be attributed to differences in the distribution of their tick vectors. Infections with *E. chaffeensis* have been most commonly associated with *Amblyomma americanum* (the Lone Star tick), whereas human granulocytic ehrlichiosis has been associated with both *Ixodes scapularis* (the deer tick) and *Dermacentor variabilis* (the dog tick). Outbreaks of ehrlichial infections have been documented in military units after they trained in endemic areas in the US.[5,6]

Review of the Defense Medical Surveillance System Database (DMED) revealed only two cases of ehrlichiosis among US Army personnel in South Korea since 1995. Both cases were reported in 1998. The clinical history of the subject patient of this report strongly suggests that her ehrlichial infection was acquired in Korea. Anecdotally, during the past fall season, the Internal Medicine Service at the 121st General Hospital cared for several US Army personnel referred from the northern regions of the peninsula who presented with similar constellations of clinical symptoms and concomitant hematologic and hepatic abnormalities. Each case responded to empiric doxycycline therapy, though no infectious etiologic agents were identified. In light of this patient's seropositivity to *E. chaffeensis* and her absence of travel outside of Korea, one cannot exclude the presence of a newly identified reservoir of ehrlichia in South Korea.

Report and comment by David S. Sachar, CPT, MC, USA, Internal Medicine Service, 121st General Hospital, Yongsan, Korea.

References

1. Maeda K, Markowitz N, Hawley RC, Ristic M, Cox D, McDade JE. Human infection with *Ehrlichia canis*, a leukocytic rickettsia. *N Engl J Med*, 1987;316:853-6.

2. Dawson JE, Anderson BE, Fishbein DB, et al. Isolation and characterization of an *Ehrlichia* sp. from a patient diagnosed with human ehrlichiosis. *J Clin Microbiol*, 1991;29:2741-5.

3. Anderson BE, Dawson JE, Jones DC, Wilson KH. *Ehrlichia chaffeensis*, a new species associated with human ehrlichiosis. *J Clin Microbiol* 1991;29:2838-42.

4. Bakken JS, Dumler JS, Chen SM, Eckman MR, Van Etta LL, Walker DH. Human granulocytic ehrlichiosis in the upper Midwest United States: a new species emerging? *JAMA*, 1994;272:212-8.

5. Petersen LR, Sawyer LA, Fishbein DB, Kelley PW, Thomas RJ, Magnarelli LA, Redus M, Dawson JE. An outbreak of ehrlichiosis in members of an Army Reserve unit exposed to ticks. *J Infect Dis*, 1989;159(3):562-8.

6. Yevich SJ, Sanchez JL, DeFraites RF, Rives CC, Dawson JE, Uhaa IJ, Johnson BJ, Fishbein DB. Seroepidemiology of infections due to spotted fever group rickettsiae and *Ehrlichia* species in military personnel exposed in areas of the United States where such infections are endemic. *J Infect Dis*, 1995;171:1266-73.

Surveillance Trends

Completeness and Timeliness of Reporting of Hospitalized Notifiable Cases, US Army, January 2000-June 2000

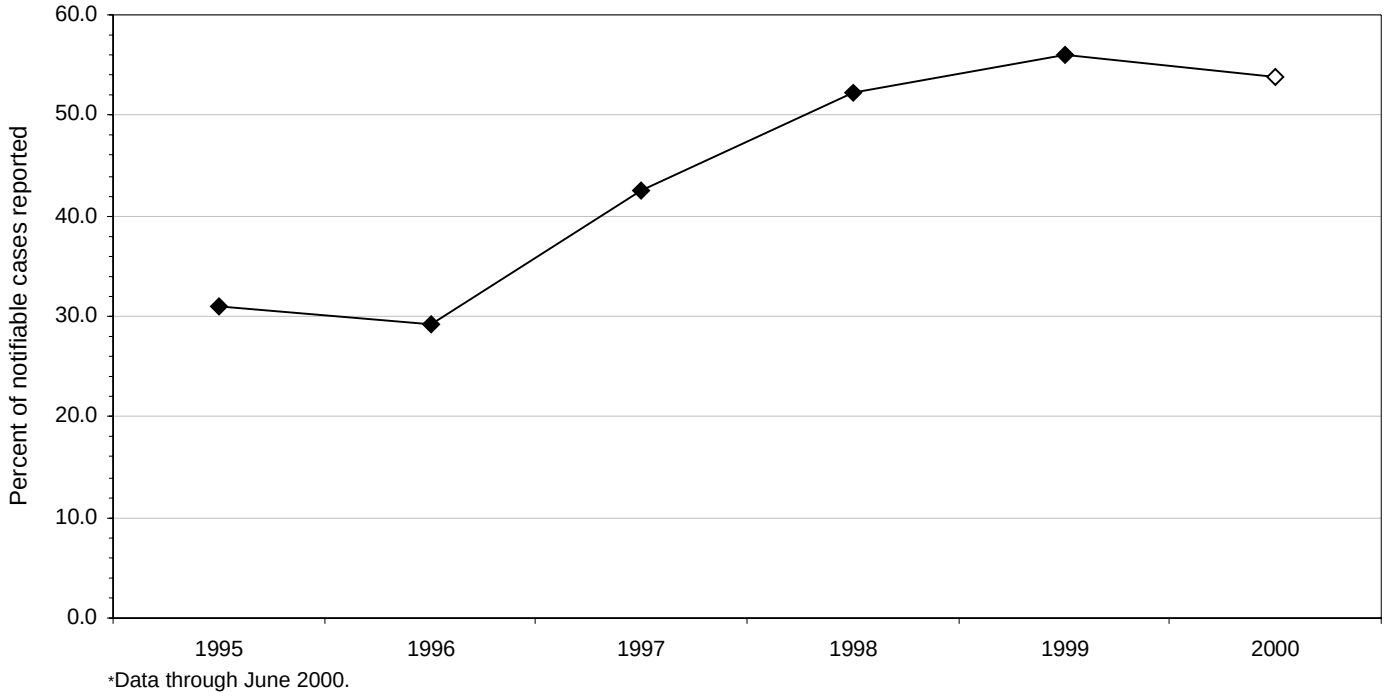
The US Army began conducting automated reporting of notifiable medical conditions in 1994. In June 1998, the Office of the Army Surgeon General informed medical activity commanders of the requirement to report all occurrences of medical conditions specified in the tri-service consensus list of reportable events (*Tri-Service Reportable Events: Guidelines and Case Definitions, Version 1.0, July 1998*).[1] In November 1998, the Assistant Secretary of Defense for Health Affairs directed that the consensus list be used by all the Service medical departments for medical events reporting and that case reports of all Services be integrated in the Defense Medical Surveillance System (DMSS).[2] This report is the seventh semiannual assessment of Armywide reporting of hospitalized notifiable medical events among active duty soldiers.

Completeness of reporting, hospitalizations overall. There were 145 hospitalizations of active duty soldiers for conditions considered reportable (based on ICD-9-CM coded discharge diagnoses) between January and June 2000. Of these, 78 (54%) were reported through the Army's Reportable Medical Events System (RMES). The completeness of reporting in 2000 was slightly lower than in 1999 and slightly higher than in 1998, indicating a leveling-off of the long-term trend of increasing reporting completeness (figure 1).

Completeness of reporting, hospitalizations, by diagnosis. The largest number of reportable hospitalizations were for varicella (n=47), heat injuries (n=46), pneumococcal pneumonia (n=12), and malaria (n=10). Completeness of reporting of these diagnoses were 62%, 65%, 8% and 70%, respectively (table 1, page 14).

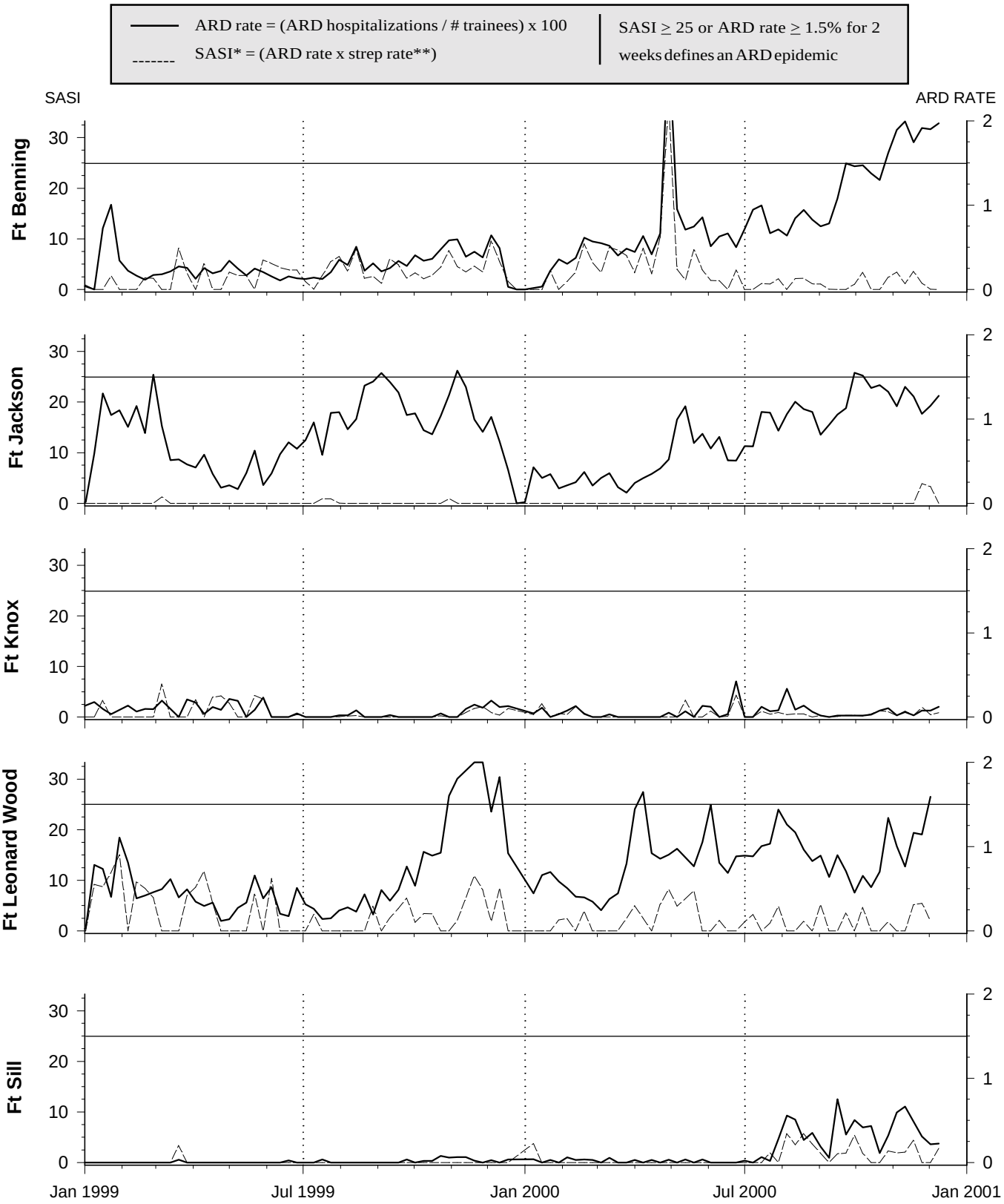
Completeness of reporting, by site. There continued to be significant variability in reporting

Figure 1. Completeness of reporting of reportable hospitalizations, US Army, 1995-2000*



*Data through June 2000.

Figure II. Acute respiratory disease (ARD) surveillance update
US Army initial entry training centers



* SASI (Strep ARD Surveillance Index) is a reliable predictor of serious strep-related morbidity

** Strep rate = (Group A beta-hemolytic strep(+) / # cultures) x 100

Table 1. Completeness of reporting, reportable hospitalizations among active duty soldiers, by diagnosis, 1998-2000*

Reportable event	1998			1999			2000		
	Reported	Total	%	Reported	Total	%	Reported	Total	%
Amebiasis	0	1	0	0	1	0	0	1	0
Campylobacter infection	0	0	-	1	1	100	1	1	100
Carbon monoxide poisoning	4	11	36	0	0	-	0	0	-
Coccidioidomycosis	0	0	-	1	3	33	0	2	0
Cold weather injury	6	6	100	1	2	50	1	2	50
Dengue fever	1	1	100	1	1	100	0	0	-
Gonorrhea	5	6	83	0	2	0	1	5	20
Haemophilus influenzae	0	0	-	0	0	-	0	0	-
Hantavirus	0	0	-	0	0	-	0	0	-
Heat	89	137	65	92	126	73	30	46	65
Hemorrhagic fever	0	0	-	0	2	0	0	0	-
Hepatitis A	2	3	67	0	3	0	0	0	-
Hepatitis B	2	4	50	3	7	43	2	2	100
Hepatitis C	0	2	0	0	1	0	0	0	-
Influenza	1	23	4	0	11	0	0	5	0
Lead poisoning	0	0	-	0	0	-	0	0	-
Leishmaniasis	1	2	50	0	0	-	0	0	-
Lyme disease	1	1	100	0	1	0	0	1	0
Malaria	26	30	87	28	40	70	7	10	70
Measles	0	1	0	0	0	-	0	0	-
Meningococcal disease	0	2	0	2	4	50	2	3	67
Pneumococcal pneumonia	0	16	0	4	14	-	1	12	8
Rheumatic fever, acute	0	1	0	0	0	-	0	0	-
Rocky Mountain spotted fever	0	1	0	0	0	-	1	1	100
Salmonellosis	3	12	25	2	8	25	0	0	-
Schistosomiasis	0	0	-	0	0	-	0	1	0
Shigellosis	0	1	0	0	0	-	0	0	-
Syphilis	1	1	100	0	0	-	0	0	-
Tetanus	1	1	100	0	0	-	0	0	-
Tuberculosis	2	7	29	1	5	20	3	5	60
Urethritis, non-gonococcal	0	0	-	0	1	0	0	0	-
Vaccine adverse event	0	1	0	0	0	-	0	0	-
Varicella	49	100	49	30	63	48	29	47	62

*Data through June 2000.

completeness across sites. For example, nine sites reported more than half of their notifiable hospitalized cases, while two sites reported none. Fort Carson (cases reported: 1; 100% of notifiable), Fort Leonard Wood (cases reported: 7; 88% of notifiable), Fort Bragg (cases reported: 15; 79% of notifiable), Fort Benning (cases reported: 13; 72% of notifiable), and Korea (cases reported: 5; 71% of notifiable) had the highest reporting completeness rates for the period (table 2).

Timeliness of reporting of hospitalized cases. Of hospitalized cases reported during 2000, 39% were reported within 1 week of hospital discharge and approximately 80% were reported within 1 month (figure 2).

The timeliness of reporting during 2000 continued a four-year trend towards less timely reporting of hospitalized notifiable cases.

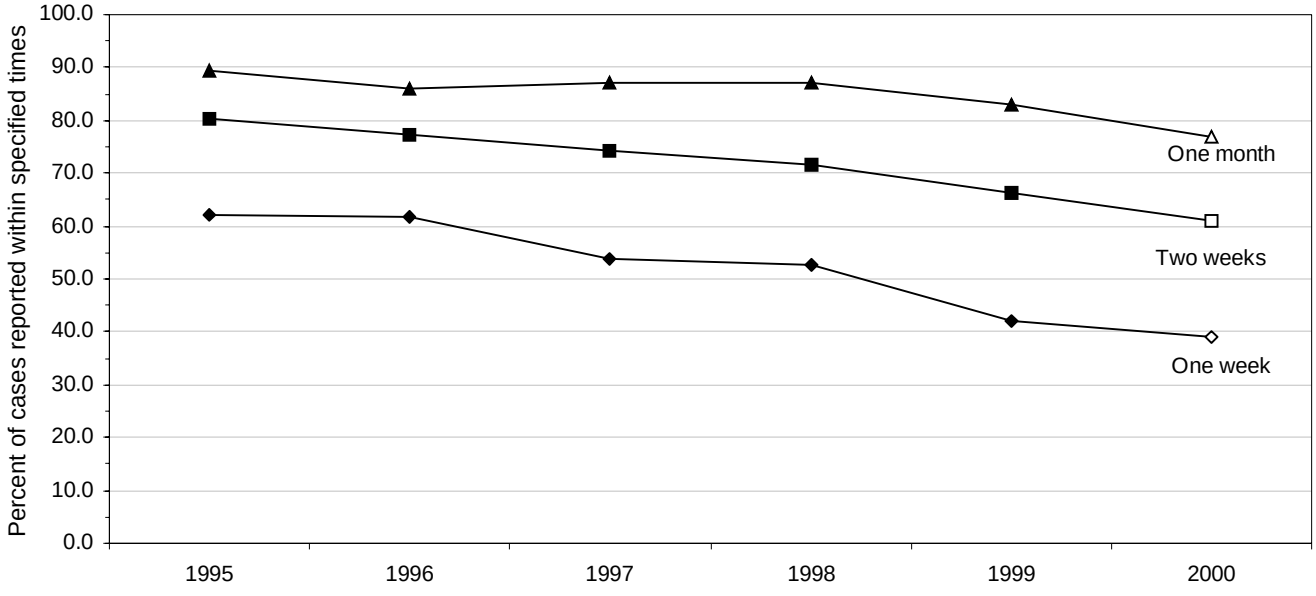
Editorial comment. For the past 4 years, the AMSA has periodically compared reported cases of notifiable conditions with counterpart diagnoses reported through standard inpatient data systems. Estimates of completeness by this method may underestimate actual reporting completeness since

Table 2. Reportable events and hospitalizations among active duty soldiers, by medical treatment facility, 1998-2000*

Location	1998			1999			2000		
	Reported	Total	%	Reported	Total	%	Reported	Total	&
A	8	12	67	3	5	60	1	1	100
B	7	8	88	5	8	63	7	8	88
C	22	32	69	22	30	73	15	19	79
D	29	54	54	48	65	74	13	18	72
E	16	26	62	19	28	68	5	7	71
F	5	5	100	5	5	100	4	6	67
G	9	14	64	6	11	55	3	5	60
H	19	21	90	2	6	33	3	5	60
I	0	1	0	0	0	-	1	2	50
J	0	0	-	2	2	100	1	2	50
K	2	14	14	6	6	100	1	2	50
L	22	28	79	7	12	58	2	4	50
M	1	4	25	2	4	50	1	2	50
N	7	12	58	5	13	38	2	4	50
O	12	41	29	4	25	16	8	17	47
P	6	9	67	6	7	86	1	3	33
Q	2	10	20	7	14	50	2	6	33
R	2	17	12	3	11	27	1	3	33
S	2	4	50	2	9	22	2	6	33
T	3	5	60	1	5	20	1	3	33
U	2	5	40	3	8	38	2	6	33
V	8	19	42	5	7	71	2	12	17
W	0	6	0	0	4	0	0	1	0
X	9	21	43	1	7	14	0	3	0

*Data through June 2000.

Figure 2. Timeliness of reporting of reportable hospitalizations, active duty soldiers, 1995-2000*



*Data through June 2000.

some ICD-9-CM codes are not specific for the reportable condition alone (i.e., they include clinical states that are not reportable); and diagnoses made in hospital settings may not be based on the same criteria as those required for a confirmed reportable case. Nonetheless, the results indicate that notifiable disease reporting Armywide may be leveling off after several years of gradual improvement.

Analysis by R. Allen Frommelt, MS, Army Medical Surveillance Activity.

References

1. Memorandum, HQ, US Army Medical Command, June 17, 1998, subject: Tri-service reportable events list.
2. Memorandum, Office of the Assistant Secretary of Defense (Health Affairs), November 6, 1998, subject: Tri-service reportable events document.

Surveillance Trends

Completeness of Reporting of Hospitalized Cases of Reportable Medical Events, US Navy, January 1998-June 2000

Regional Navy Environmental and Preventive Medicine Units track notifiable medical events in their areas of responsibility and transmit reports to the Navy Environmental Health Center (NEHC). In turn, the NEHC is responsible for tracking the overall experience of the Navy and Marine Corps and for transmitting reports to the Army Medical Surveillance Activity for inclusion in the DMSS.[1,2] This report summarizes the completeness of reporting of hospitalized cases of reportable medical events by US Navy medical treatment facilities (MTFs) during the period January 1998 through June 2000. Data for the analyses were derived from data submitted to the DMSS by NEHC.

Completeness of reporting, hospitalizations, overall. Between January and June 2000, there were 78 hospitalizations of active duty personnel for reportable conditions based on ICD-9-CM coded discharge diagnoses. Of these, 10 (13%) were reported through the Navy's Medical Event Reporting System. Initial analysis indicates that the completeness of reporting in the first six months of 2000 was less than in the same period in 1999 (figure 1).

Completeness of reporting, by diagnosis. For the 30-month period from January 1998 to June 2000, the largest numbers of reported hospitalizations were for varicella (n=17), pulmonary tuberculosis (n=16), heat illness (n=14), and malaria (n=12). Estimates of completeness of reporting of these diagnoses were 16%, 57%, 11%, and 44%, respectively (table 1). These four diagnoses, along with pneumonoccal pneumonia, accounted for the highest number of reportable cases.

Completeness of reporting, by site. There was significant variability in completeness of reporting across MTFs. Portsmouth (63%) and Camp Lejuene

Figure 1. Completeness of reporting of reportable hospitalized cases, Navy Disease Reporting System, January 1998-June 2000

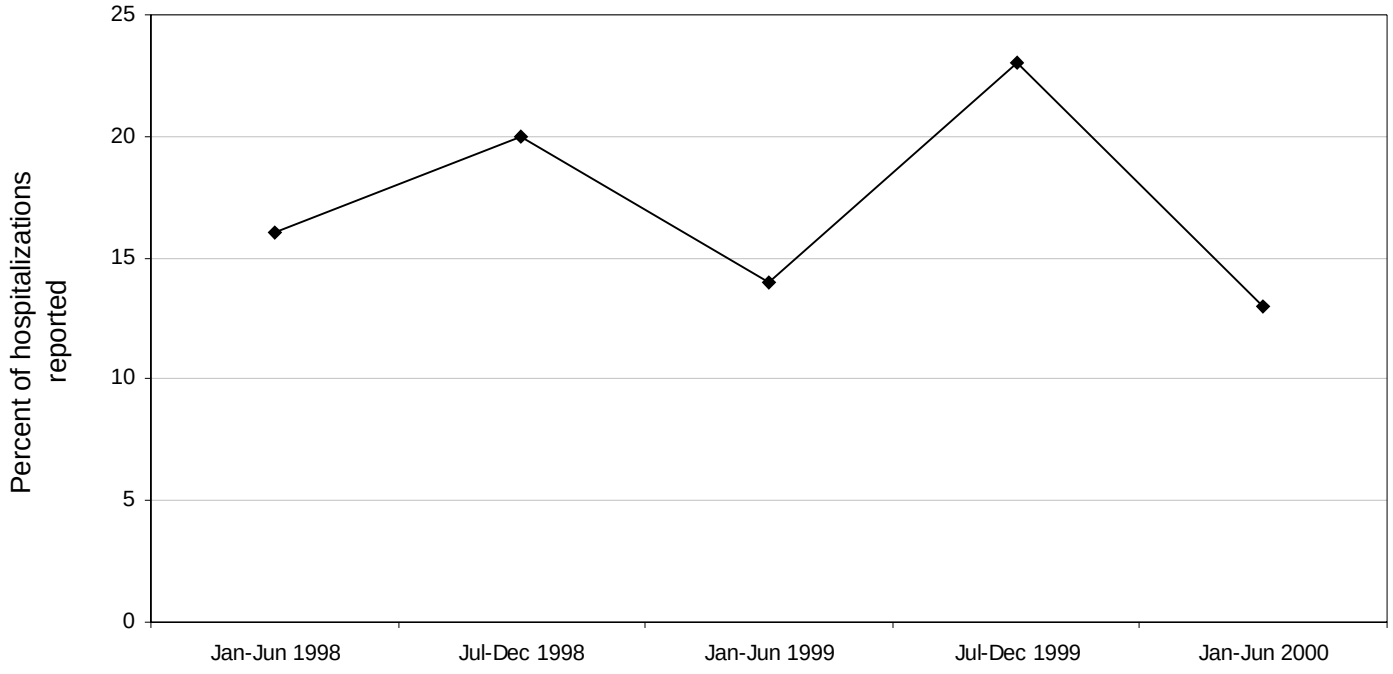


Table 1. Completeness of reporting, reportable hospitalizations among active duty sailors and marines, by diagnosis, 1998-2000

Reportable event	Number reported	Total	Percent
Heat injury	14	122	11
Varicella	17	107	16
Pneumococcal pneumonia	1	43	2
Tuberculosis, pulmonary	16	28	57
Malaria	12	27	44
Gonorrhea	2	11	18
Coccidioidomycosis	0	10	0
Hepatitis B	4	10	40
Cold weather injury	0	9	0
Influenza	0	9	0
Campylobacter infection	0	6	0
Hepatitis A	1	6	17
Leptospirosis	0	5	0
Salmonellosis	1	5	20
Meningococcal meningitis	1	4	25
Amebiasis	0	3	0
Carbon monoxide poisoning	0	3	0
Dengue fever	0	2	0
Hepatitis C	0	2	0
Lyme disease	1	2	50
Rheumatic fever, acute	0	2	0
Rocky Mountain spotted fever	0	2	0
Typhoid fever	1	2	50
E. coli O157:H7	1	1	100
Mumps	1	1	100
Shigellosis	0	1	0
Total	**73**	**423**	**17**

Table 2. Completeness of reporting, reportable hospitalizations among active duty sailors and marines, by medical treatment facility, 1999-2000

MTF	Jul-Dec 1999			Jan-Jun 2000		
	Number reported	Total reportable	Percent reported	Number reported	Total reportable	Percent reported
A	6	12	50	5	8	63
B	9	14	64	1	3	33
C	2	5	40	1	5	20
D	0	8	0	1	7	14
E	2	10	20	2	14	14
F	0	5	0	0	6	0
G	0	3	0	0	3	0
H	0	0	-	0	1	0
I	0	0	-	0	1	0
J	1	3	33	0	5	0
K	1	9	11	0	13	0
L	0	1	0	0	0	0
M	0	1	0	0	3	0
N	0	11	0	0	6	0
O	0	3	0	0	3	0
P	0	1	0	0	0	-
Q	0	1	0	0	0	-
R	0	1	0	0	0	-
S	0	1	0	0	0	-
T	0	2	0	0	0	-
Total	**21**	**91**	**23**	**10**	**78**	**13**

Note: Eleven MTFs had no reportable events during the period and are not included in the table.

(33%) had the highest reporting completeness rates for the period January-June 2000 (table 2). Thirteen sites reported fewer than 25% of their hospitalized notifiable cases, and 10 of these reported none of their cases. Sixteen MTFs had no hospitalized cases that required reporting.

Editorial comment. The methods used for this assessment may underestimate the actual completeness of reporting. (See editorial comment, pages 14, 16). However, to the extent that the methods are reliable, it appears that reporting of hospitalized cases Navy-wide has remained relatively stable.

Analysis by LCDR (sel) Jeffrey Brady, MD, and R. Allen Frommelt, MS, Army Medical Surveillance Activity.

References

1. Tri-service reportable events: guidelines and case definitions, version 1.0, July 1998.
2. Navy Environmental Health Center. Naval disease reporting system (NDRS). *Naval Medical Surveillance Report (NMSR)*, 1998, 1:4, 2.

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